WHAT IS CLAIMED IS:

1. A pattern inspection method comprising:

acquiring difference data by subtracting a real pattern window having real pattern data corresponding to predetermined pixels of the real pattern data obtained by imaging an inspection object from a design pattern window corresponding to the real pattern window and shift design pattern windows which are obtained by shifting the design pattern windows in a plurality of directions, respectively;

selecting one window from the design pattern window and shift design pattern windows such that the selected one window has a minimum difference data; and

performing a pattern inspection of the inspection object based on a difference value between the selected one window and the real pattern window.

2. The pattern inspection method according to claim 1,

wherein the acquiring step, selecting step and performing step are repeatedly executed with respect to all pixels of the real pattern data.

3. The pattern inspection method according to claim 1,

wherein the plurality of directions are eight directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° with respect to a noticed pixel of said real pattern window.

4. The pattern inspection method according to claim 1,

wherein the performing step comprises:

selecting a central pixel of the selected one window

obtaining a difference value between the selected central pixel and a central pixel of the window of said real pattern data, and

determining a defect of the inspection object by comparing the obtained difference value between the selected central pixel of the selected one window and a threshold value set in advance.

5. The pattern inspection method according to claim 1,

wherein a shift width of the shifted design pattern windows is within one pixel.

6. The pattern inspection method according to claim 1,

wherein the performing step comprises:

obtaining a difference value by subtracting a noticed pixel of the selected one window and predetermined pixels surrounding the noticed pixel of the selected one window from a noticed pixel of the real pattern window and predetermined pixels surrounding the noticed pixel of the real pattern window,

outputting 1) a "0" difference value in a case where the obtained difference value is within a

difference value obtained by shifting the design pattern window by one pixel or less, 2) a difference value obtained by subtracting the minimum value from the obtained difference value in a case where the

5   obtained difference value is less than a minimum value of difference values obtained by shifting the design pattern window and 3) a difference value obtained by subtracting a maximum value of difference values which are obtained by shifting the design pattern window by

10   one pixel or less from the obtained difference value in a case where the obtained difference value is lager than the maximum value, and

performing the pattern inspection of the inspection object by comparing the outputted difference

15   value with a threshold value set in advance.

7.   The pattern inspection method according to claim 1,

wherein the difference value is determined based on a lightness of pixels in the real pattern data and a

20   lightness of pixels in the design pattern data.

8.   A pattern inspection device comprising:

means for acquiring difference data by subtracting a real pattern window having real pattern data corresponding to predetermined pixels of the real

25   pattern data obtained by imaging an inspection object from a design pattern window corresponding to the real pattern window and shift design pattern windows which

are obtained by shifting the design pattern windows in
a plurality of directions, respectively;

means for selecting one window from the design
pattern window and shift design pattern windows such
that the selected one window has a minimum difference
data; and

means for performing a pattern inspection of the
inspection object based on a difference value between
the selected one window and the real pattern window.

9. The pattern inspection device according to
claim 8,

wherein the acquisition of the difference data by
the means for acquiring, selection of the selected on
window by the means for selecting and pattern
inspection performed by the means for performing are
repeatedly executed with respect to all pixels of the
real pattern data.

10. The pattern inspection device according to
claim 8,

wherein the plurality of directions are eight
directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°,
315° with respect to a noticed pixel of said real
pattern window.

11. The pattern inspection device according to
claim 8,

wherein the performing step comprises:

means for selecting a central pixel of the

selected one window,

obtaining a difference value between the selected central pixel and a central pixel of the window of said real pattern data, and

5   determining a defect of the inspection object by comparing the obtained difference value between the selected central pixel of the selected one window and a threshold value set in advance.

12.   The pattern inspection device according to

10   claim 8,

wherein a shift width of the shifted design pattern windows is within one pixel.

13.   The pattern inspection device according to claim 8,

15   wherein the means for performing comprises

obtaining a difference value by subtracting a noticed pixel of the selected one window and predetermined pixels surrounding the noticed pixel of the selected one window from a noticed pixel of the

20   real pattern window and predetermined pixels surrounding the noticed pixel of the real pattern window,

outputting 1) a "0" difference value in a case where the obtained difference value is within a

25   difference value obtained by shifting the design pattern window by one pixel or less, 2) a difference value obtained by subtracting the minimum value from

the obtained difference value in a case where the
obtained difference value is less than a minimum value
of difference values obtained by shifting the design
pattern window and 3) a difference value obtained by
subtracting a maximum value of difference values which
are obtained by shifting the design pattern window by
one pixel or less from the obtained difference value in
a case where the obtained difference value is lager
than the maximum value, and

performing the pattern inspection of the
inspection object by comparing the outputted difference
value with a threshold value set in advance.

14. The pattern inspection device according to
claim 8,

wherein the difference value is determined based
on a lightness of pixels in the real pattern data and a
lightness of pixels in the design pattern data.

15. A method of manufacturing a mask comprising:

preparing a substrate with a light shielding film
on which a mask pattern is formed; and

inspecting the substrate with the light shielding
film on which a mask pattern is formed,

wherein the inspecting step comprises:

acquiring difference data by subtracting a real
pattern window having real pattern data corresponding
to predetermined pixels of the real pattern data
obtained by imaging the mask pattern from a design

pattern window corresponding to the real pattern window and shift design pattern windows which are obtained by shifting the design pattern windows in a plurality of directions, respectively;

5   selecting one window from the design pattern window and shift design pattern windows such that the selected one window has a minimum difference data; and

performing a pattern inspection of the mask pattern based on a difference value between the

10   selected one window and the real pattern window.

16. The method according to claim 15,

wherein the acquiring step, selecting step and performing step are repeatedly executed with respect to all pixels of the real pattern data.

15   17. The method according to claim 15,

wherein the plurality of directions are eight directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° with respect to a noticed pixel of said real pattern window.

20   18. The method according to claim 15,

wherein the performing step comprises:

selecting a central pixel of the selected one window,

obtaining a difference value between the selected

25   central pixel and a central pixel of the window of said real pattern data, and

determining a defect of the mask pattern by

comparing the obtained difference value between the
selected central pixel of the selected one window and
a threshold value set in advance.

19. The method according to claim 15,

wherein a shift width of the shifted design
pattern windows is within one pixel.

20. The method according to claim 15,

wherein the performing step comprises:

obtaining a difference value by subtracting a
noticed pixel of the selected one window and
predetermined pixels surrounding the noticed pixel of
the selected one window from a noticed pixel of the
real pattern window and predetermined pixels
surrounding the noticed pixel of the real pattern
window,

outputting 1) a "0" difference value in a case
where the obtained difference value is within a
difference value obtained by shifting the design
pattern window by one pixel or less, 2) a difference
value obtained by subtracting the minimum value from
the obtained difference value in a case where the
obtained difference value is less than a minimum value
of difference values obtained by shifting the design
pattern window and 3) a difference value obtained by
subtracting a maximum value of difference values which
are obtained by shifting the design pattern window by
one pixel or less from the obtained difference value in

a case where the obtained difference value is lager than the maximum value, and

performing the pattern inspection of the mask pattern by comparing the outputted difference value with a threshold value set in advance.